

Contents

| | |
|---|---------------|
| Introduction | xxxiii |
| Part I: Introduction | 1 |
| Chapter 1: Introduction to Windows PowerShell | 3 |
| Managing Windows — The Challenges of the Past..... | 3 |
| Management in the Early Days | 3 |
| Management with Windows NT | 4 |
| Management with Windows Server 2003..... | 4 |
| Introducing Windows PowerShell..... | 5 |
| What Is Windows PowerShell? | 5 |
| Windows PowerShell as a Task Automation Platform..... | 5 |
| Windows PowerShell's Scripting Language..... | 6 |
| Windows PowerShell in Production Scripts and Admin GUIs | 7 |
| Key Windows PowerShell Concepts | 8 |
| Cmdlets..... | 8 |
| Objects..... | 9 |
| The Pipeline | 10 |
| Discovery and the Community | 10 |
| Get-Help | 11 |
| Get-Command..... | 11 |
| Get-Member..... | 12 |
| The Windows PowerShell Community | 12 |
| Windows PowerShell Language Constructs | 13 |
| Variables..... | 13 |
| Operators..... | 14 |
| Expressions..... | 16 |
| Providers | 18 |
| Formatting Output..... | 18 |
| Default Formatting..... | 19 |
| Formatting Using Format-Table and Format-List | 20 |
| Formatting with Windows PowerShell Hashtables | 22 |
| Scripting..... | 23 |
| What Is a Script? | 23 |
| Alternation or Conditional Execution | 24 |
| Iteration — Operating on a Collection or Array..... | 27 |
| Error and Exception Handling | 30 |

Contents

| | |
|--|-----------|
| Extending Windows PowerShell with Snap-ins and Modules | 34 |
| Windows PowerShell Snap-ins | 35 |
| Windows PowerShell Modules | 36 |
| Installing Windows PowerShell | 36 |
| Windows PowerShell Version Support | 37 |
| Getting Windows PowerShell for Downlevel OSs | 37 |
| Script Security and Execution Policy | 37 |
| Customizing Windows PowerShell with Profiles | 39 |
| What Is a Profile? | 39 |
| Where Are Your Profiles? | 40 |
| Managing Profiles in the Enterprise | 41 |
| Summary | 42 |
| Chapter 2: What's New in Windows PowerShell V2 | 43 |
| The Road to V2 | 43 |
| The Version 2 Betas | 43 |
| V2 in Windows 7/R2 | 44 |
| V2 on Downlevel OSs | 45 |
| Using Remoting | 45 |
| What Is Remoting? | 46 |
| Windows PowerShell Remoting Architecture | 46 |
| Setting Up Remoting | 48 |
| Using Remoting | 48 |
| Serialization | 50 |
| Working with Jobs | 50 |
| What Is a Job? | 51 |
| Using Jobs | 51 |
| Potential Glitches Associated with Jobs | 52 |
| Using Advanced Functions | 52 |
| What's New with Advanced Functions? | 53 |
| Comment-Based Help | 54 |
| Cmdlet Binding | 55 |
| Splatting | 56 |
| Working with Modules | 57 |
| What Is a Module? | 57 |
| Script Modules | 57 |
| Manifest Modules | 59 |
| Implicit Modules | 59 |
| Making Use of Eventing | 61 |
| What Is Eventing? | 61 |
| Using Eventing | 61 |
| Using the Integrated Scripting Environment | 63 |
| Supporting Transactions | 63 |
| The Need for Transactions | 63 |
| Transaction Support for V2 | 64 |

| | |
|--------------------------------------|----|
| Debugging and Error Handling..... | 65 |
| Debugging from the Command Line..... | 65 |
| Using Try/Catch/Finally | 66 |
| New Cmdlets..... | 67 |
| Summary | 67 |

Part II: Windows Desktop 69

Chapter 3: Managing Windows 771

| | |
|--|----|
| Troubleshooting Windows 7 with Windows PowerShell..... | 71 |
| Managing Windows Search | 77 |
| Discovering Which Folders Are Currently Indexed | 77 |
| Adding Folders to the Index | 79 |
| Removing Folders from the Index | 81 |
| Re-Indexing the Search Catalog | 82 |
| Checking HotFix Status | 84 |
| Managing Files and Folders | 84 |
| Setting Security on Files and Folders..... | 84 |
| Listing Unique File Extensions | 87 |
| Counting a Specific Type of Files | 88 |
| Finding Empty Folders..... | 89 |
| Searching with Windows Search | 89 |
| Opening a File Using Its Default Handler | 91 |
| Summary | 92 |

Chapter 4: Managing Microsoft Office 201095

| | |
|---|-----|
| Introducing the Office COM Objects | 96 |
| The Office Application Objects | 96 |
| Cleaning Up after Your Office Scripts..... | 97 |
| Automating Microsoft Word | 98 |
| Creating or Opening a Document..... | 98 |
| Adding Content | 98 |
| Searching for Text | 102 |
| Formatting Text | 103 |
| Spell Checking | 105 |
| Printing | 106 |
| Saving a Document | 106 |
| Working with Microsoft Excel Spreadsheets | 107 |
| Creating and Opening a Workbook..... | 107 |
| Worksheets | 107 |
| Working with Cells | 108 |
| Managing Data..... | 111 |
| Generating Charts and Graphs | 112 |
| Searching Spreadsheets..... | 113 |
| Navigating Microsoft Outlook..... | 113 |
| A Word about Security | 114 |

Contents

| | |
|--|------------|
| Traversing Folders | 114 |
| Working with Outlook Items | 116 |
| Working with an Outlook MailItem | 116 |
| Working with an Outlook AppointmentItem | 117 |
| Working with an Outlook ContactItem | 118 |
| Working with an Outlook TaskItem | 119 |
| Additional Office COM Examples | 119 |
| Summary | 121 |
| Chapter 5: Managing Security | 123 |
| NTFS Permissions | 124 |
| Retrieving Current NTFS Permissions | 124 |
| Modifying NTFS Permissions | 126 |
| Share Permissions | 127 |
| Retrieving Current Share Permissions | 127 |
| Modifying Share Permissions | 132 |
| Registry Settings | 135 |
| Retrieving Current Registry Permissions | 136 |
| Modifying Registry Permissions | 137 |
| Managing the Windows Firewall | 139 |
| Checking Firewall Status | 139 |
| Opening and Closing Ports | 144 |
| Enabling Remote Desktop | 147 |
| Checking the Status of Remote Desktop | 148 |
| Summary | 149 |
| Chapter 6: Managing and Installing Software | 151 |
| Listing Software | 151 |
| Using WMI | 152 |
| Using the Windows Registry | 153 |
| Creating Software Baselines | 155 |
| Installing Software | 157 |
| Using Restore Points | 157 |
| Using WMI | 158 |
| Removing Software | 159 |
| Removing Software Using WMI | 159 |
| Removing Software Using Windows Registry | 159 |
| Dealing with Spaces | 160 |
| Summary | 162 |
| Part III: Server Management | 163 |
| Chapter 7: Managing Windows Server 2008 R2 | 165 |
| What's New in Server 2008 R2 | 165 |
| Default Installation of Windows PowerShell | 165 |

| | |
|--|------------|
| Windows PowerShell Included in Server Core | 166 |
| Managing Server Features and Roles | 167 |
| Running Best Practice Analyzer Scans | 169 |
| Running Scans Locally | 169 |
| Running Scans Remotely | 172 |
| Enabling Remoting | 173 |
| Managing Windows Backup | 174 |
| Installing the Cmdlets | 174 |
| Configuring New Backup Jobs | 174 |
| Checking the Status of Backup Jobs | 176 |
| Deleting Backup Jobs | 177 |
| Starting and Stopping Backup Jobs | 178 |
| Scheduling Backup Jobs | 178 |
| Limitations in the Cmdlets | 179 |
| Managing Server Migration | 180 |
| Installing the Cmdlets | 180 |
| Discover What Can Be Migrated | 182 |
| Exporting Features | 183 |
| Importing Features | 184 |
| Managing AppLocker | 186 |
| Summary | 187 |
| Chapter 8: Performing Basic Server Management | 189 |
| Discovering Server Configuration | 189 |
| Managing Scheduled Tasks | 191 |
| Checking Hotfix Status | 194 |
| Checking Hotfixes on Multiple Computers | 194 |
| Checking for a Specific Hotfix | 195 |
| Gathering Data from Event Logs | 195 |
| Using System Time | 198 |
| Retrieving the Date and Time | 198 |
| Setting the Date and Time | 200 |
| Summary | 201 |
| Chapter 9: Performing Advanced Server Management | 203 |
| Managing Command-Line Services | 203 |
| Listing Running Services on Multiple Servers | 204 |
| Finding Servers Running a Specific Service | 204 |
| Listing Stopped Services That Are Set to Start Automatically | 205 |
| Managing Processes | 207 |
| Listing All Processes on Multiple Servers | 207 |
| Stopping Processes on Remote Servers | 208 |
| Reading the Registry | 209 |
| Using the Registry Provider Locally | 210 |
| Using Microsoft.Win32.RegistryHive Remotely | 210 |

Contents

| | |
|---|------------|
| Setting Registry Values | 211 |
| Locally Using the Registry Provider | 212 |
| Remotely Using Microsoft.Win32.RegistryHive | 212 |
| Validating Network Configuration on Remote Servers | 213 |
| Retrieving the DNS Settings | 214 |
| Validating That Servers Use the Same DNS Settings | 214 |
| Changing the Network Configuration | 215 |
| Gathering Data from Performance Counters | 217 |
| Modifying Regional Settings on Multiple Computers | 218 |
| Managing Local Accounts | 219 |
| Modifying Local Users and Groups | 219 |
| Creating and Deleting Local Users and Groups | 220 |
| Configuring Remote DCOM | 221 |
| Viewing DCOM Permissions | 222 |
| Granting a Domain User Remote DCOM Access | 226 |
| Summary | 227 |
| Chapter 10: Managing Active Directory | 229 |
| Installing and Using the Cmdlets | 230 |
| Prerequisites | 230 |
| A Word About Remoting | 231 |
| Installation | 231 |
| Using the Active Directory Provider | 232 |
| Querying Active Directory | 234 |
| Users, Groups, and Computers | 234 |
| Querying Group Membership | 238 |
| User and Group Administration | 240 |
| Creating Users and Groups | 240 |
| Modifying Properties | 242 |
| Working with Group Membership | 243 |
| Common Tasks | 244 |
| Managed Service Accounts | 246 |
| Managing Organizational Units | 247 |
| Moving Active Directory Objects | 247 |
| Creating Organizational Units | 248 |
| Removing Active Directory Objects | 249 |
| Password Policies | 249 |
| Viewing Password Policies | 250 |
| Creating a Fine-Grained Policy | 251 |
| Modifying Password Policies | 251 |
| Managing the Rest of Active Directory | 252 |
| Managing Active Directory with the ActiveRoles Management Shell | 253 |
| Installing the Cmdlets | 253 |
| Using the Cmdlets | 253 |
| Summary | 255 |

| | |
|--|------------|
| Chapter 11: Managing Group Policy | 257 |
| Installing and Using the Cmdlets | 257 |
| Enabling the Module on Windows Server 2008 R2..... | 257 |
| Installing the Module on Windows 7 | 258 |
| A Word about Remoting | 258 |
| Getting Policy Information..... | 258 |
| Group Policy Objects (GPOs)..... | 258 |
| Group Policy Links | 261 |
| Resultant Set of Policy (RSOP) | 262 |
| Creating and Configuring GPOs | 262 |
| Backing Up and Restoring GPOs..... | 264 |
| Group Policy Security..... | 265 |
| Getting Security Information | 265 |
| Setting Permissions..... | 265 |
| Summary | 266 |

Part IV: Server Applications **269**

| | |
|---|------------|
| Chapter 12: Managing Microsoft Exchange Server | 271 |
| Installing the Cmdlets on a Workstation | 271 |
| Microsoft Exchange Server 2007 | 272 |
| Microsoft Exchange Server 2010 | 272 |
| What's New in Microsoft Exchange Server 2010..... | 273 |
| Managing Microsoft Exchange Server Permissions..... | 274 |
| Microsoft Exchange Server 2007 | 274 |
| Microsoft Exchange Server 2010 | 275 |
| Administering Objects | 276 |
| Administering Recipients..... | 279 |
| Managing Databases | 309 |
| Microsoft Exchange Server 2007 | 310 |
| Microsoft Exchange Server 2010 | 310 |
| Finding Mailbox Database White Space..... | 311 |
| Discovering Space Used by Disabled Mailboxes..... | 313 |
| Managing Quotas | 316 |
| Managing Microsoft Exchange Server Remotely..... | 320 |
| Email Address Policies | 322 |
| Interoperating with Earlier Versions of Microsoft Exchange..... | 324 |
| Microsoft Exchange Server 2007 | 325 |
| Microsoft Exchange Server 2010 | 326 |
| Using Filters | 328 |
| Using Client-Side Filters..... | 328 |
| Using Server-Side Filters | 329 |
| Managing Recipient Scope | 330 |
| Managing Scope in Microsoft Exchange Server 2007 | 331 |
| Managing Scope in Microsoft Exchange Server 2010 | 331 |

Contents

| | |
|--|------------|
| Managing Role Based Access Control | 332 |
| Introducing Microsoft Exchange Web Services | 335 |
| Summary | 339 |
| Chapter 13: Managing SQL Server 2008 R2 | 341 |
| PowerShell Basics for SQL Server | 341 |
| Managing SQL Server Services | 343 |
| Working with Snap-ins | 344 |
| Working with Assemblies | 345 |
| Changing the Service Account | 346 |
| Querying SQL Server | 347 |
| Using a Quoted String to Query SQL Server | 347 |
| Returning Data into a Datable | 348 |
| Using an Input File to Query SQL Server | 349 |
| Loading Data | 350 |
| Loading SQL Server Data | 350 |
| Loading Non-SQL Server Data | 351 |
| Getting SQL Server Information | 351 |
| Getting Version Information | 352 |
| Getting Service Pack Information | 352 |
| Getting Instance Uptime Information | 352 |
| Gathering Performance Counters | 354 |
| Scripting Objects | 357 |
| Scheduling Windows PowerShell SQL Server Agent Job Steps | 362 |
| Getting Space Usage Information | 363 |
| Getting Volume Space Usage | 363 |
| Getting Database Space Usage | 363 |
| Getting Table Space Usage | 365 |
| Managing Registrations in SQL Server Management Studio | 366 |
| Leveraging Registrations to Query Multiple Registered Servers | 367 |
| Leveraging Registrations to Query Multiple Central Management Servers | 369 |
| Summary | 369 |
| Chapter 14: Managing Microsoft SharePoint 2010 Server | 371 |
| Installing and Using the Cmdlets | 371 |
| SharePoint 2010 Management Shell | 372 |
| PipeBind Parameters | 372 |
| SPAssignment | 372 |
| Remoting with SharePoint | 373 |
| Limitations of the SharePoint Cmdlets | 373 |
| Memory Limits in WS-Man | 373 |
| Automating Site Administration | 374 |
| Creating Site Collections | 374 |
| Connecting to Sites | 374 |
| Removing Sites | 375 |

| | |
|---|------------|
| Using SharePoint Lists | 375 |
| Browsing Lists | 375 |
| Viewing List Data | 376 |
| Updating List Data | 376 |
| Adding Items to a List | 376 |
| Working with Views | 377 |
| Creating Lists | 378 |
| List Settings | 378 |
| Managing Permissions | 378 |
| Managing Document Libraries | 379 |
| Creating a Web Application | 381 |
| Deploying Developer Code | 381 |
| Administering Workflows | 382 |
| Manually Kicking Off Workflows | 382 |
| Monitoring Workflows | 382 |
| Cancelling Workflows | 383 |
| Backing Up and Restoring | 384 |
| The Configuration Database | 384 |
| Farms | 385 |
| Site Collections | 385 |
| Lists and Libraries | 386 |
| Search and Timer Jobs | 386 |
| Modifying Crawls | 387 |
| Kicking Off Crawls | 387 |
| Summary | 388 |
| Chapter 15: Managing Internet Information Services 7 | 389 |
| Installing the Necessary Components | 390 |
| Installing the Snap-in | 390 |
| Installing the Web Server Role | 390 |
| Loading the WebAdministration Cmdlets and Provider | 391 |
| Installing the WMI Provider | 392 |
| Browsing IIS:\ | 393 |
| Scripting Deployments and Changes | 394 |
| Using New-Item | 394 |
| Creating Sites | 395 |
| Creating Virtual Directories | 396 |
| Creating Web Applications | 397 |
| Creating Application Pools | 398 |
| Configuring SSL | 398 |
| Using the Provider to Make Changes | 399 |
| Removing IIS Objects with the Cmdlets | 400 |
| Advanced WebConfiguration Settings | 400 |
| Managing IIS | 403 |
| Controlling IIS Services | 404 |
| Backing Up and Restoring Configurations | 405 |

Contents

| | |
|--|------------|
| Digesting Log Files | 406 |
| ConvertFrom-Csv | 406 |
| Filtering Tips | 407 |
| Summary | 407 |
| Chapter 16: Managing System Center Operations | |
| Manager 2007 R2 | 409 |
| Exploring the Available Cmdlets | 409 |
| Working with Alerts | 410 |
| Processing Alerts in Bulk | 410 |
| Updating Custom Fields in Alert Properties in Bulk | 413 |
| Automating Maintenance Mode | 415 |
| Adding and Removing Objects and Groups | 415 |
| Automating Client-Side (Remote) Maintenance Mode | 417 |
| Deploying and Configuring OpsMgr Agents and Network Devices | 418 |
| Configuring Agent Failover Without AD Integration | 419 |
| Managing SNMP Device Failover | 419 |
| Automating Agent Discovery and Deployment | 421 |
| Verifying Agent Load Balance Across Management Servers | 422 |
| Exploring Discovered Inventory Data | 423 |
| Enumerating Classes and Discovered Instances | 423 |
| Enumerating Monitored Objects and Relationships | 425 |
| Windows PowerShell and the Command Notification Channel | 426 |
| Performing Simple Event and Log File Creation from the Command Channel | 427 |
| Forwarding SNMP Traps with Windows PowerShell | 429 |
| Overrides | 431 |
| Retrieving and Converting Overrides into Readable Reporting Format | 431 |
| Creating Overrides Programmatically | 434 |
| Notifications | 435 |
| Enabling and Disabling Notifications | 435 |
| Working with Notification Recipients | 435 |
| Monitoring Scripts in Windows PowerShell | 436 |
| Sample OpsMgr Scripts and Other Community Resources | 437 |
| Where to Find and Share Samples on the Web | 438 |
| Where to Find Free Support on Authoring Windows PowerShell Scripts for OpsMgr | 438 |
| Summary | 439 |
| Chapter 17: Managing Microsoft Deployment | |
| Toolkit 2010 | 441 |
| Installing and Using the Cmdlets | 441 |
| Exploring the MDT Windows PowerShell Provider | 442 |
| Using the GUI to Create Your Scripts | 442 |

| | |
|--|------------|
| Creating and Populating the Deployment Share | 443 |
| Initializing the Deployment Share..... | 443 |
| Creating the MDT Database | 444 |
| Importing Operating Systems | 444 |
| Importing Device Drivers | 445 |
| Importing Applications | 446 |
| Creating Task Sequences | 449 |
| Managing the Deployment Share | 451 |
| Configuring the Deployment Share..... | 451 |
| Updating the Deployment Share..... | 452 |
| Managing Media | 452 |
| Summary | 454 |
| Chapter 18: Managing Citrix XenApp 6 | 455 |
| Installing and Using the Cmdlets | 455 |
| What's New in XenApp 6 | 456 |
| Working with Administrators | 456 |
| Retrieving Administrators | 456 |
| Adding and Removing Administrators | 457 |
| Enabling and Disabling Administrators | 458 |
| Modifying Privileges | 459 |
| Providing Applications | 462 |
| Retrieving Applications..... | 462 |
| Publishing New Applications..... | 463 |
| Modifying Application Properties..... | 465 |
| Importing/Exporting Applications..... | 465 |
| Adding and Removing Assigned Accounts..... | 466 |
| Removing and Disabling Applications | 466 |
| Managing Sessions | 467 |
| Enumerating Sessions | 467 |
| Managing Session Processes | 469 |
| Managing Sessions | 469 |
| Maintaining Servers | 470 |
| Managing Server Logons..... | 470 |
| Getting Server Load..... | 471 |
| Managing Load Evaluators | 471 |
| Changing Server Zones..... | 473 |
| Applying Load-Balancing Policies | 473 |
| Creating Load-Balancing Policies | 473 |
| Configuring Load-Balancing Policies | 474 |
| Applying Filters to Load-Balancing Policies | 474 |
| Worker Groups | 475 |
| Adding and Removing Worker Groups | 475 |
| Modifying Worker Groups | 476 |
| Summary | 477 |

Contents

| | |
|---|------------|
| Chapter 19: Managing Citrix XenDesktop 5 | 479 |
| Introducing Citrix XenDesktop 5 | 479 |
| Examining the Windows PowerShell Tab | 480 |
| Exploring the Snap-Ins | 481 |
| Performing an Automated Environment Setup | 481 |
| Administrators | 486 |
| Explaining Access Control | 486 |
| Creating Administrators | 487 |
| Catalogs | 488 |
| Creating Catalogs | 488 |
| Managing Catalogs | 496 |
| Removing Catalogs | 497 |
| Provisioning | 497 |
| Introducing Machine Creation Services | 498 |
| Updating Master Images | 498 |
| Desktop Groups | 499 |
| Creating Desktop Groups | 499 |
| Creating Application Desktop Groups | 502 |
| Hosts | 505 |
| Hosts PSProvider | 505 |
| Adding Hosts | 506 |
| Removing Hosts | 508 |
| Summary | 509 |
| | |
| Part V: Virtualization and Cloud Computing | 511 |
| <hr/> | |
| Chapter 20: Managing Hyper-V 2008 R2 | 513 |
| Hyper-V Management Interfaces | 513 |
| WMI Management Classes | 513 |
| Windows PowerShell Management Library for Hyper-V | 515 |
| Managing Hosts | 516 |
| Retrieving Information | 516 |
| Using Show-HypervMenu | 516 |
| Managing Virtual Machines | 517 |
| Creating and Modifying Virtual Machines | 517 |
| Controlling Virtual Machines | 518 |
| Summary | 521 |
| | |
| Chapter 21: Managing System Center Virtual Machine Manager 2008 R2 | 523 |
| Working with System Center Virtual Machine Manager 2008 R2 | 523 |
| Installing and Loading the Cmdlets | 523 |
| Backing Up the VMM Database | 524 |
| Using the VMM Administrator Console to Write Scripts | 524 |
| Connecting to VMM | 525 |

| | |
|--|------------|
| Working with Host Servers | 526 |
| Adding Hosts to VMM | 526 |
| Organizing Hosts | 528 |
| Managing Clusters | 528 |
| Adding Clusters | 528 |
| Performing Maintenance on Host Servers | 530 |
| Working with Virtual Machines | 531 |
| Creating and Modifying Virtual Machines | 531 |
| Removing Virtual Machines | 535 |
| Controlling Virtual Machines | 535 |
| Managing Checkpoints | 536 |
| Libraries | 537 |
| Creating a Library | 538 |
| Finding Dependent Objects | 539 |
| Summary | 539 |
| Chapter 22: Managing Windows Azure | 541 |
| Installing and Using the Windows Azure Service Manager Cmdlets | 541 |
| Installing the WASM Cmdlets | 542 |
| Creating and Registering Your Certificate | 542 |
| Managing Hosted Services | 544 |
| Getting Hosted Service Information | 544 |
| Starting and Stopping Deployments | 545 |
| Get-OperationStatus | 546 |
| Deploying New Code | 546 |
| Scaling Services | 548 |
| Managing Certificates | 548 |
| Windows Azure Diagnostics | 549 |
| Getting Logging Configuration | 549 |
| Configuring Logging | 551 |
| Forcing Logs to Transfer to Storage | 553 |
| Summary | 554 |
| Chapter 23: Managing VMware vSphere PowerCLI | 557 |
| Installing and Using the Cmdlets | 557 |
| Installing PowerCLI | 557 |
| Loading PowerCLI | 558 |
| Connecting to a Host or vCenter Instance | 558 |
| Retrieving Hosts and VMs | 559 |
| Managing ESX and ESXi | 560 |
| Putting Hosts in Maintenance Mode | 560 |
| Inspecting Host Properties | 560 |
| Managing Storage | 562 |
| Managing Host Networks | 563 |
| Configuring NTP Servers | 564 |
| Working with Host Profiles | 565 |

Contents

| | |
|---|-----|
| Getting Logs | 566 |
| Gathering Performance Data from a Host | 567 |
| Managing Virtual Machines | 568 |
| Deploying New VMs | 568 |
| Removing VMs | 569 |
| Working with Virtual Hardware | 569 |
| Managing VM Resource Configuration | 571 |
| Updating VM Tools | 571 |
| Starting and Stopping VMs | 572 |
| Using Snapshots | 572 |
| Invoking Scripts | 573 |
| Managing vCenter | 573 |
| Clusters | 573 |
| Migrating VMs | 574 |
| Managing Folders, Resource Pools, and Datacenters | 575 |
| Getting Log Data | 575 |
| Getting Performance Data | 576 |
| Everything Else | 576 |
| Summary | 577 |

Part VI: Beyond the Console **579**

Chapter 24: Creating User Interfaces **581**

| | |
|--|-----|
| Working with Text Mode UI | 581 |
| Getting Credentials | 582 |
| Getting Strings | 583 |
| Validating Input | 583 |
| Building a Simple UI in Windows PowerShell Using Windows Forms | 584 |
| Using Windows Forms | 585 |
| Building a GUI with Windows Forms — the Basics | 585 |
| Using Windows Forms Controls | 586 |
| Label Control | 586 |
| Button Control | 588 |
| Textbox Control | 589 |
| Using Windows PowerShell and PrimalForms | 593 |
| Using Windows Presentation Foundation | 595 |
| Summary | 596 |

Chapter 25: Using the Windows PowerShell ISE **597**

| | |
|--|-----|
| Key Features of the ISE | 597 |
| Screen Layout | 598 |
| Modifying the ISE Layout | 606 |
| Using the ISE | 607 |
| The ISE as an Alternative to the Windows PowerShell Console | 607 |

| | |
|---|------------|
| Using the ISE to Edit Windows PowerShell Scripts/Modules..... | 607 |
| ISE Profile Files | 608 |
| Debugging with the ISE | 608 |
| Setting and Using Breakpoints in the ISE..... | 609 |
| Debugging | 609 |
| Extending the ISE..... | 610 |
| Overview of the ISE Object Model | 610 |
| What's in \$PsISE | 617 |
| Sample Windows PowerShell ISE Add-On | 620 |
| Third-Party Alternatives to the ISE | 620 |
| Summary | 622 |
| Index | 623 |